

School Teaching Practice and Skills Acquisition: Trainee Mathematics Teachers Speak Out

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Abstract: *This paper presents and discusses findings from third year students who have been on school teaching practice as a formal and mandatory part of their undergraduate studies at a named university in Central Zambia. The students taking Mathematics as a major or a minor course shared their perceptions of the contributions that school teaching practice made to the acquisition and development of skills with a special focus on soft skills. The data which was collected by use of a questionnaire with open-ended questions and in-depth follow-up interviews shows that School Teaching Practice (STP) is instrumental in skills acquisition especially soft skills. It also reveals that while the trainee teachers valued the contribution that the university made, through the courses they undertook before embarking on their STP, toward the development of their skills they greatly valued the experience of learning and developing the soft skills through their STP. They argued that the focus of the university time courses is largely the development of academic or technical knowledge and skills, at the expense of soft skills needed to help them cope with the realities of teaching in particular and life beyond university walls in general. One of the conclusions made is that the university should step up and assume more responsibility to supplement the training in soft skills especially that students spend more time at university than they do during STP.*

Key Words: *School Teaching Practice (STP), hard skills, soft skills, trainee teachers.*

Introduction

School Teaching Practice (STP), a form of practical training, is a fundamental part of trainee teachers' development as teachers. It is widely considered as an influential orientation into the teaching profession (Gray, Wright, Pascoe, 2017). A well designed, organised and supported STP can help trainee teachers acquire and develop the needed professional knowledge, values, skills and teaching experience. Generally, trainee teachers at University level take relevant professional education courses as well as methods courses in their respective teaching subjects and do their peer teaching before their STP. The knowledge and skills gained during university time prepare the trainee teachers to teach during STP, and at the same time STP itself can contribute to acquisition of knowledge and skills which include technical knowledge and skills (also called hard skills) and also non-technical knowledge and skills (soft skills). This paper presents and discusses trainee teachers' perceptions of the contributions that school teaching practice made to the acquisition and development of skills with a focus on soft skills.

This paper has four sections. In the first section, the literature pertaining to a summary

of some key issues concerning hard and soft skills and relation to STP are discussed. In the second section the methodology used for the study is presented. The third section deals with the main issues arising from the data collected from trainee teachers' perceptions of the contributions that STP made to their acquisition and development of skills with a focus on soft skills. The discussion of findings and conclusion together with the recommendations for future work and research are in the last section.

Literature review

In addition to being multifaceted, teaching can be complicated by nature. It can be complicated in both preparation and practice (Ngang, Hashim, & Yunus, 2015) and not only requires technical knowledge and skills (hard skills), but also non-technical knowledge and skills (soft skills) to draw upon, manage and succeed in it.

Hard skills

Hard skills are technical requirements of a job and tend to be specific to an activity or task (Schulz, 2008: Attakorn, Tayut, Pisitthawat, & Kanokorn, 2014). They are largely academic knowledge and skills. 'In the working environment, hard skills normally refer to technical procedures or practical tasks that are typically easy to observe, quantify, and measure' (Shakir, 2009: 309). In teaching in general they include skills related to teaching, content knowledge and pedagogy. In the case of teaching Mathematics, they include; mathematics comprehension skills, Mathematics communication skills, Mathematical reasoning skills among others (Attakorn et al., 2014; Hendriana, 2017).

Soft skills

What are soft skills? Soft skills may be difficult to define. Schulz (2008) argues that this could be because the perception of what is a soft skill differs from context to context and may differ from individual or organisation perception to another. Soft skills may be referred to as generic skills which include non-academic skills. To elaborate on this, Schulz (2008) for instance, by referring to the broad definition of soft skills in Wikipedia (2007) states that soft skills are very different skill categories that can include:

- Personal qualities such as imagination, passion, curiosity etc
- Interpersonal skills, such as communication skills, collaboration skills etc and
- Additional skills/knowledge which refer to skills that can be learnt by undergoing training such as additional qualification. The third category being an addition to the definition in Wikipedia which is primarily based on the first two categories indicated above.

Fleischmann (2013) on the other hand defines soft skills as the interpersonal, human, people or behavioural skills needed to apply technical skills and knowledge in the workplace. Thus, soft skills can be considered as interpersonal qualities or people skills and personal attributes that one needs to be able to execute and complete a task.

One of the points that appears to stand out in the definitions is that soft skills cannot stand on their own in fulfilling the work roles and responsibilities such as may be defined by teaching job for instance. This is because for one to teach they also need the technical knowledge and skills related to the subject they are teaching. Darling-Hammond & Bransford (2005) also add that teachers need

soft skills to be able to understand subject matter or content, learners and how to teach that specific subject content. Soft skills complement hard skills (Schulz, 2008).

Soft skills are an indicator of job performance as much as hard skills. Based on a study carried out by Harvard University, Protocol School of Washington, the Carnegie Foundation and Stanford Research Institute Crosbie (2005) brings out the evidence that about 15 percent of the reasons for individuals to get a job, keep the job and advance in that job is attributed to technical knowledge and skills and the remaining 85 percent of the success in a job is linked to an individual person's soft skills. It can be contested that this evidence may not be directly related to teaching. However, it does bring out the lesson on the significance attached to soft skills in a work environment.

The other point to note is that soft skills relate to dealing effectively with people. How does this relate to teaching? Teaching is a people profession. It involves working with many people (Attakorn et al., (2014) among them pupils, fellow teachers in the same or different department, administrators, parents among others. Soft skills help in relating well and effectively with people of different categories such as identified above. With respect to teachers and learners, soft skills can shape individual teachers' personality which subsequently can have an influence on the young learners' aptitude in soft skills. (Schulz, 2008).

Methodology

This qualitative research involved a sample of 87 students who had been on school teaching practice as a formal and mandatory part of their undergraduate studies in 2017. Trainee teachers at named university in the Central Zambia are supposed to specialise in two teaching subjects-taking one as a major or a minor subject. The students in this study were taking Mathematics either as a major or a minor subject. In sharing the STP experiences, the students shared their perceptions of the contributions that school teaching practice made to the acquisition and development of skills through a questionnaire and follow-up in-depth interviews. The questionnaire was made up open-ended questions related to the skills the students had acquired/developed during their STP and which aspects of their STP contributed to the acquisition/development of the identified skills. No restrictions were placed on the number of responses to be provided per item in the questionnaire. Content analysis method was used in the analysis of collected data.

Findings

Skills acquired during STP

After analysing the content there were twenty-three (23) different skills that the trainee teachers identified. These are indicated in Table 1 below.

Table 1: Skills identified by identified by trainee Mathematics teachers

S/No	Skill	Frequency (f)
1	Motivating/ Inspiring skills/bringing out the best in pupils (especially in terms of them learning mathematics)	82
2	Listening	81
3	Speaking	80
4	Presenting skills	79
5	Collaboration skills	79
6	Teamwork skills	78
7	Standing up for what 'I' believed in/ strong belief/Holding on to correct ideas/standing up for 'myself	77
8	(Openness to) learning from others	73
9	Giving instruction	72
10	Managing discussions	72
11	Dealing with difficult people	72
12	Receiving instruction	70
13	Passion	70
14	Dealing with another's anger	66
15	Time management	66
16	Convincing others	65
17	Curiosity	65
18	Negotiation skills	50
19	Dealing with anger	47
20	Dealing with criticism	46
21	Decision making	45
22	Non-verbal communication skills/body language	40
23	Managing (mathematical content) knowledge	20

As seen from Table 1 above, it is clear that the student teachers indicated more soft skills than hard skills. The list of soft skills above cannot be considered exhaustive however, it shows that there were various skills that the trainee teachers perceived to have acquired and or developed during their STP. Motivating skills, effective communication-related skills such as listening, speaking and presenting skills, and collaboration and collaboration-related skills such as managing discussions and motivating skills were cited more times than the other skills. The least skill to be mentioned was managing (mathematics content) knowledge

Students were able to elaborate on the identified skills during the in-depth interviews. For instance, one student had this to say in relation to motivating learners:

It sounds very easy when our lecturers at university talk about motivating learners, but it is not. STP has developed something in me to actually explore means of motivating the learners...one just has to find ways of motivating them if the teaching and especially the learning is to take place... (Interview 6)

Another had this to say when referring to effective communication skills:

...It was very difficult for me to communicate with the teachers in the school, even the pupils themselves..., but now I can. There is just something about TP (teaching practice) like the environment itself that somehow helps you to learn and improve your communication skills especially listening... (interview 21)

Yet another student had this to say in connection with coping with the realities of teaching:

The idea of teaching is exciting, but the reality is something else...there is more than I knew that one needs to be able to cope with the challenges you could possibly face. TP itself has helped me to realise this... (interview 1)

An example of a comment made during interviews with respect to collaboration skills is:

I am used to doing things on my own, but you cannot do that with TP or maybe even teaching after graduation in. I have realised that you need to work out a way of working with others otherwise you would be doomed... (interview 10)

The least skill to be mentioned was managing (mathematics content) knowledge. During the interview one student said:

It is like you do a lot of hard Mathematics at University and you don't during STP. I know there are some difficult Mathematics topics to teach, but I never encountered any of such during my TP. I just had to work with the easy Mathematics ... (interview 8)

Aspects of STP that facilitated the skills acquisition

The trainee Mathematics teachers were also asked about what aspect of their STP contributed to the acquisition of skills such as the ones identified above. Their responses are indicated in Table 2 below.

Table 2: Trainee Mathematics teachers' perceptions of aspects of STP that contributed to acquisition of skills

S/No	Aspect of STP	Frequency (f)
1	Time keeping (Timetable/Timeliness/ Time consciousness)	72
2	Increased interaction opportunities (such as Interaction with pupils beyond class time; interaction with staff with different backgrounds and teaching experiences).	67
3	Being given responsibility	64
4	Opportunities for decision making	62
5	Continuing Professional Development programme (largely citing lesson study)	60
6	Documenting document management	58
7	Having a mentor	57
8	Nature of real (actual)teaching e.g. flexibility that comes with it especially when your learners are struggling to understand the concepts positive attitude even when things don't seem to go on well	50
9	(Continuous)reporting to supervisors	49
10	Supervisors/ School leadership (HOD/Head Teacher)	45
11	Code of ethics/work ethics	44
12	Problems or challenges encountered during STPs	10

The top three aspects of STP that the trainee teachers identified as having contributed to skills acquisition during STP were: Time keeping (72), increased interaction opportunities (67), being given responsibilities (64) and the least being problems or challenges encountered during STP (10). During interviews the trainee teachers were able to qualify their responses to the related questionnaire item. For instance, with respect to the timeliness aspect of STP one student had this to say:

At university if I am not serious about managing my time well, it will generally be me who will be negatively affected...however in the school set up it means others like pupils will be affected too. So, this point helped me to go an extra mile to try and manage my time well... (Interview 11)

Another student had this to say regarding increased interaction opportunities which contributed to the development of communication and collaboration skills:

It is like teaching is all about people. These can be pupils, teachers, administrators, parents etc...It is like one is left with no choice, but to learn some skills to help him or her interact well with such people. I think the skills for interacting with pupils are even needed more because one gets to spend more time with them than any other ... (Interview 3)

Several students shared that they were given additional responsibility such as stand-in or acting HOD, class teacher, mathematics club Patron/Matron among others during their STP. One student had this to say about the additional responsibility given:

...Being given responsibilities like I was given helped me to gain several skills such as leadership skills. In fact, opportunities for making decisions increased and somehow, I

found myself more than before making very important decisions with not as much struggle... (interview 19)

The least mentioned aspect of STP to contribute to soft skills acquisition is was problems encountered during STP. During interviews students gave some examples of challenges they faced during STP. These included: (negative) attitude of some members of staff in the department/school; Time constraints; fear of evaluation by school supervisors and lecturers, handling very big classes. Some students indicated that it was such aspects of their STP that contributed to the development of important skills. An example of a student's comment is:

For me it was like the challenges I was facing made me acquire some skills. Let me give you an example. Some teachers in the Mathematics department were mean and giving me a very tough time through and through no matter what nice or good thing I did. I had to find a way of dealing such difficult people and with their criticisms...I think I have become a little bit more patient and tolerant of people from this experience... (Interview 5)

Another student added...*you know with lack of teaching/learning aids it is like my creativity was provoked more than before... (interview 12).*

Discussion and Conclusion

This study sought to find out trainee Mathematics teachers' perceptions of the contributions that STP made to the acquisition of skills. The trainee teachers' responses show that STP is very useful for developing soft skills. The trainee teachers indicated that while they valued the contribution that the university made, through the courses they undertook before embarking on their STP,

toward the development of their skills, they greatly valued the experience of learning and developing the soft skills through their STP. They generally argued that the focus of the university time courses is largely the development of academic or technical knowledge and skills, and usually at the expense of soft skills needed to help them cope with the realities of teaching in particular and life beyond university walls in general.

Trainee Mathematics teachers' perspectives on learning skills from the STP experience align with studies such as that by Gilbert, Tozer, & Westoby (2017) that argue that soft skills can be learnt to some extent. They can be learnt in different contexts. One such context is during STP itself. The other is at institutions of higher learning such as university. Therefore, it is recommended that teacher educators at university also commit to work in collaboration with practicing schools to help with students' acquisition of all relevant skills-hard and soft.

Soft skills may be considered difficult to teach (Sancho-Thomas, Fuentes-Fernández, & Fernández-Manjón, 2009), but universities can still supplement STP efforts in the development of both hard and soft skills. This could be done by training in hard skills and also, raising awareness of the importance of soft skills, and consciously and actively practicing soft skills with trainee teachers (Schulz, 2008). Raising the importance of soft skills is not meant to demean the importance of hard skills. In line with other studies such as Schulz (2008), Fleischmann (2013) and Heckman & Kautz (2012) soft skills complement hard skills. Universities may not provide a complete set of soft skills required in a teaching environment, but they

still have a role to play to raise awareness of and provide the necessary opportunities for student teachers to develop the said skills to help them teach effectively and lead successful personal lives. This is consistent with the argument by Heckman & Kautz, (2012) that soft skills have an important role to play in ensuring success in personal and work life.

The paper has discussed trainee Mathematics teachers' perspectives on the skills acquired through STP and the aspects of STP that have contributed to the acquisition of the identified skills. It has therefore added knowledge to the discussion on the relevance of internship or practical training such as STP in skills acquisition in literature. However, further research may be required to confirm or validate the results and findings of this research and also to fill or at least further narrow the knowledge gaps in literature related to the relevance of STP in skills acquisition.

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